# THE EFFECTS OF AUDIO CUEING ON THE RATE OF TEACHER PRAISE



GLENDA MARY NOSEWORTHY
SPENCER

100814

## NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us a poor photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

## THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

## AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de mauvaise qualité.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

## LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS REÇUE

# The Effects of Audio Cueing on the Rate of Teacher Praise

by

Glenda Mary Noseworthy Spencer, B.Sc.

A Thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science

Department of Psychology
Memorial University of Newfoundland

December 1976

St. John's Newfoundland

Acknowledgements

I thank Dr. Albert Kozma, my supervisor, for his advice, encouragement and for providing the opportunities that led to this thesis. Dr. David Hart and Dr. Michael Stones, the other members of my committee deserve credit for advice and constructive criticism.

I owe a great deal to the teacher, Adrian Parsons, for her constant cooperation and tolerance, the four children, Francis, Gary, Nickie and Allister, for their unwitting aid, and the Avalon Consolidated School Board for permitting me to work within their jurisdiction.

Lastly, I would like to thank Christopher Spencer for his help with the reliability checks and his help with the construction of the graphs. Also, I would like to thank Christopher for his constant advice and encouragement, both of which contributed greatly to the completion of this thesis.

## Abstract

The effects of audio cueing on teacher praise rate was investigated in a special class of four children with behaviour problems. After establishing baselines on teacher praise rate and the children's constructive and inappropriate behaviours, auditory cues were given to prompt increased praising. Introduction of the cues significantly increased the teacher's praise rate and resulted in a generalized effect to noncued periods. In addition, there was a concomitant increase in the frequency of the children's constructive behaviour and a decrease in the frequency of their inappropriate behaviour. It had been planned to introduce an audio cue to apply time-out in a multiple baseline fashion. However, when the frequency of inappropriate behaviour decreased with the increased praise rate, no opportunity arose to cue time-out. The results were interpreted as indicating that audio cueing is an effective teacher training technique.

Table of Contents


| | Page |
|---|---|
| Acknowledgements | ii |
| Abstract | iii |
| List of Tables | v |
| List of Figures | vi |
| Introduction | 1 |
| Method | 19 |
| Results | 33 |
| Discussion | 45 |
| References | 54 |
| Appendix A | 58 |
| Appendix B | 60 |
| Appendix C | 62 |
| Appendix D | 67 |
| Appendix E | 69 |

## List of Tables


| Table | | Page |
|---|---|---|
| 1. | Percentages of Agreement in Occurrences of Defined Child Behaviours | 34 |
| 2. | Percentages of Agreement in Occurrences and Non-Occurrences of Defined Teacher Behaviours | 35 |
| 3. | Mean Frequency of Teacher Praise Statements per 30 Minutes for Each Observation Period in Each Experimental Phase | 40 |

## List of Figures


Figure | Page

1. Daily rate of teacher praise statements for cue and no cue conditions in each experimental phase . . . . . 37

2. Mean rate of teacher praise statements for cue and no cue conditions in each experimental phase . . . . . 38

3. Mean percentage (for all four children of 15 second interveals engaged in constructive, inappropriate, and neutral behaviours for each observation day in all experimental phases . . . . . 42

4. Mean percentage of 15 second intervals, averaged across days and children, of constructive, inappropriate and neutral behaviour in each experimental phase . . . . 43

It has been well documented that praise has a very important function for children, parents, and teachers (Becker, Madsen, Arnold and Thomas, 1967; Broden, Bruce, Mitchell, Carter and Hall, 1970; Hall, Lund and Jackson, 1968; Kennedy and Willcutt, 1964; McAllister, Stachowiak, Baer and Conderman, 1969; Madsen, Becker and Thomas, 1968; O'Leary and Becker, 1968; Schutte and Hopkins, 1970; Thomas, Becker and Armstrong, 1968; Ward and Baker, 1968).

Becker, Madsen, Arnold and Thomas (1967), working within an elementary classroom, instructed teachers to give praise and attention for achievement, presocial behaviour and following the group rules. They found that praising and attending to appropriate behaviour, which was incompatible with a deviant behaviour, was critical in reducing the deviant behaviour. Madsen, Becker and Thomas (1968) also found that teacher praise or approval for appropriate behaviour resulted in effective classroom management and a reduction in inappropriate behaviour.

Thomas, Becker and Armstrong (1968) found that when teacher approval for appropriate classroom behaviour was withdrawn, disruptive behaviours increased from an average of 8.7% to an average of 25.5%. When teacher approval was reinstated disruptive behaviours dropped to an average of 12.9%. Ward and Baker (1968) further found that when

teachers systematically ignored deviant behaviour and reinforced task relevant productive behaviour with praise and attention, there was a significant decrease in disruptive behaviour in the target children. McAllister, Stachowiak, Baer and Conderman (1969) also found that statements of praise and disapproval decreased both the target behaviours of inappropriate talking and turning around in an entire class of high school students.

In a study by Broden, Bruce, Mitchell, Carter and Hall (1970), the teacher praised and attended to one child when he engaged in appropriate behaviour and ignored his inappropriate behaviour. She then ceased attending to the child and began the treatment procedure with a second child. Broden et al. (1970) found that such contingencies increased the attending behaviour of the target child as well as that of the other child at the adjacent desk.

Throughout all these studies, the general finding has been that praise, contingent upon appropriate behaviour, results in an increase in appropriate behaviour and a subsequent decrease in inappropriate or disruptive behaviour. Since praise is so effective in producing behaviour changes, especially in the classroom, then teachers should be trained to give praise freely, emphatically, and immediately whenever a child is engaging in constructive behaviours.

Teacher Training Techniques

There have been several techniques developed to train teachers to recognize and correctly identify appropriate and inappropriate behaviours. In addition to the identification of behaviours, the teachers are also trained to apply the proper contingencies following the occurrence of either appropriate or inappropriate behaviours.

The first training technique is a simple instruction. The teacher is informed of the behaviours that she is to attend to and the method for doing so is provided. In a study by Cossairt, Hall and Hopkins (1973), teachers were at first given a brief explanation that positive teacher attention contingently applied is effective in changing student behaviours. Following this explanation, instructions were given to the teacher to praise students who attended to teacher instructions. Finally, the teachers were given a written message reminding them that teacher praise for attending instructions sometimes increases instruction-attending behaviour. The results of the instructions condition were inconclusive. Of the two teachers involved in this training condition, one teacher increased her praise rate while the other did not show any such behaviour change. In addition, Rule (1972) found simple instructions to produce no effective change in teacher praise behaviour.

Giving teachers instruction to contingently praise their students' appropriate behaviours is a simple technique to alter teacher behaviour. However, based on the findings of Cossairt et al. (1973), and Rule (1972), simple instructions are often ineffective in changing teacher praise rate.

A second technique used in teacher training is verbal, graphic or written feedback. With this procedure, the teacher is informed as to how she is performing, (i.e., she is supplied with information with regard to time spent in attending to appropriate behaviour and time spent in attending to inappropriate behaviour). In most cases, the teacher is observed in the classroom and following a set period of time, a report is given to her regarding her behaviour. This report can be either verbal, graphic or written. Rule (1972) found graphic feedback to have a variable effect in altering teacher behaviour. Cossairt, Hall and Hopkins (1973) found feedback to be effective only when combined with social praise for teacher behaviour. Cooper, Thomson and Baer (1970), and Parsonson, Baer and Baer (1974) showed feedback to be effective when given quite frequently. However, to give such feedback frequently would mean interrupting the teacher, who is usually quite busy with her students. This procedure, then, would seem slightly cumbersome in most settings.

A third training procedure is videotaped feedback. The teacher views herself on tape and then scores her own classroom behaviour. This method was found successful in modifying teacher praise rates by Saudargas (1972) and Thomas (1971). However, Rule (1972) found this technique to have a variable effect on teacher behaviour. The main disadvantage of videotaped feedback is that it employs too much of the teacher's time outside the classroom. Therefore, this technique may be aversive to the teacher. A further disadvantage of this procedure is that video equipment is costly and must be protected against theft.

Fourthly, direct intervention has been used (Rule, 1972). In this procedure, a trained observer intervenes at the end of each five minute period. If the teacher behaviour that is recorded is appropriate, the teacher is praised. If it is not, then the observer replaces the teacher and teaches for 3-5 minutes. Rule (1972) found this procedure to be effective in increasing desirable teacher behaviours and decreasing undesirable teaching behaviours. Although effective, this technique also seems cumbersome in the applied setting and may prove aversive to the teacher involved.

A fifth technique in teacher training involves role playing. Jones and Eimers (1975) found that this procedure enabled teachers to reduce disruptiveness in classes of approximately 28 students. This method consists of having

the teacher role play with the experimenters in a simulated classroom setting over a number of sessions. Again, although successful in altering teacher behaviour, this technique would require much more of the teacher's time outside the classroom setting and, therefore, may be neither economical nor practical.

Sixthly, modeling has been used to alter teacher behaviour. Ringer (1973) used a 'token helper' who assumed the teacher's role within the classroom and then modeled the appropriate behaviour for the teacher. However, this technique failed to increase teacher attention to appropriate pupil behaviour.

A seventh technique devised by Clark, Macrae, Ida and Smith (1975) consists of (a) written instruction, (b) modeling, (c) verbal feedback, (d) graphic feedback. This package, a combination of many previously discussed individual techniques, was found effective in establishing a variety of teaching skills and in increasing the rate of praise. However, this method involves frequent feedback and modeling and is, therefore, likely to prove cumbersome for both the observer and the teacher.

In the training techniques previously discussed, especially feedback, modeling or role-playing, there is greater involvement of a consultant or model. Because such a consultant's time may be costly, these techniques may not prove practical.

Finally, an eighth approach to alter teacher behaviour is to prompt her to praise frequently. This approach entails signalling the teacher to praise someone when an appropriate child behaviour occurs. The method has been used in teaching parents to apply proper social contingencies to their children's behaviours (Hawkins, Peterson, Schweid and Bijou, 1966; Moore and Bailey, 1973). Hall, Lund and Jackson (1968) also used this technique with elementary school teachers. In the Hall et al. (1968) study, the observer signalled the teacher to praise study behaviour, by holding up a small square of coloured paper. Unfortunately, with this technique, the teacher must always be visually attentive to the observer in order to follow through on these signals.

A modification of the Hall et al. (1968) procedure was proposed by Van Houten and Sullivan (1975). Instead of a visual signal, Van Houten and Sullivan employed an auditory cue as their signal. Since the present investigation is concerned primarily with the effects of audio cueing, this procedure will be discussed in detail.

Audio Cueing

In the Van Houten and Sullivan (1975) study, the audio cue was a tone played on a cassette recorder and delivered at the rate of either two or three per minute to the classrooms via the public address system. The

classrooms involved were a special class, a fourth grade class and a seventh grade class. Each class consisted of more than 14 students. While the cues were not contingent on the occurrence of appropriate behaviours, it was assumed that at any point in time there would be a child engaging in such behaviour. Therefore, the teachers were simply informed that whenever they heard the tone, they were to look around and praise someone who was behaving appropriately. The teachers were further informed that the purpose of the cueing was to increase the rate, distribution and the pacing of their praise.

Van Houten and Sullivan found auditory prompting to be very effective in increasing the rate of teacher praise in all cases. Teacher A's mean baseline rate of praise of 0.5 praises per minute rose to 2.5 praises per minute during the two per minute cueing phase and then rose to 3.1 praises per minute during the three per minute cueing phase. In a similar fashion, Teacher B rose from 0.4 during baseline to 1.5 and 2.7 during the two cueing phases. Teacher C, who received only the two cues per minute condition increased from a baseline rate of 1.1 praises per minute to 2.4 praises per minute during the cueing phase. Moreover, during the two baseline periods that followed each of the two cueing phases, all three teachers maintained or surpassed the rate of praise achieved in the treatment conditions.

This technique appears to be a very simple but effective means of increasing teacher praise rates. It is economical and noncumbersome to the observer. It does not require additional time from the teacher outside the classroom setting and does not require her to visually attend to the observer during class.

However, several questions are raised by the Van Houten and Sullivan (1975) study. The first question concerns the generality of Van Houten and Sullivan's findings. These investigators found teachers' rates of praise to increase significantly in a special class of 16 students, a fourth grade class of 23 students and a seventh grade class of 15 students. All these classes were located in a low socio-economic multiracial area. Of main concern here is whether audio cueing would be effective in increasing teacher praise rate in a class with a different population of students (e.g., different sized classes, other socio-economic backgrounds, presence of behavioural problems, etc.). A second concern is whether audio cueing would be effective in increasing teacher praise rate with different teachers (e.g., experienced, inexperienced, good or poor teachers). Van Houten and Sullivan did not state the teaching experience or the capabilities of the three teachers involved in their study.

A second question raised by the Van Houten and Sullivan study deals with teacher base rates. The three teachers in the Van Houten and Sullivan study had extremely high base rates of 0.5, 0.4 and 1.1 praises per minute. The question of concern is the reason for such high base rates. Several reasons may be speculated. The first is that high base rates may be a function of experienced or good teachers. A second reason may be that teacher base rates may vary with class size. This means that a teacher of a large class, having more occurrences of appropriate behaviour, has more opportunities to praise such behaviour. Therefore this teacher's base rate may be high. A teacher of a small class, having fewer occurrences of appropriate behaviour, has fewer opportunities to praise such behaviour. Therefore, she may have a lower base rate. Thirdly, the high base rates achieved in the Van Houten and Sullivan study may be explained as a function of the information the teachers received before the baseline recording. All three teachers were aware that the experimenters were present to help them increase their praise rates. This awareness, alone, may explain the initial high base rates.

A third question, not answered by the Van Houten and Sullivan study, concerns the effect of an increased rate of teacher praise on the students' behaviour. In all likelihood, an increased rate of teacher praise should

increase the students' appropriate behaviour and decrease their inappropriate behaviours (Becker et al., 1967; Broden et al., 1970; McAllister et al., 1969; Madsen et al., 1968; Ward and Baker, 1968). However, Van Houten and Sullivan did not report on the effect of increased praise rate on student behaviour.

Fourthly, a question was posed by Van Houten and Sullivan as to whether or not the cueing system would be effective if the observers were not present during training. This question is very relevant since audio cueing is a very economical teacher training technique. It may prove very valuable to many teachers who, for various reasons, cannot receive the guidance they may need. Therefore, if cueing is effective in increasing praise rates without the observer's presence, then teachers may be capable of using this technique without supervision.

## The Present Investigation

The present study investigated the effectiveness of audio cueing within a special class of four behaviour problem children. This special class was based on a program of systematic integration. Only children of average intelligence are accepted into such a class, since the aim of the program is to eventually return the children to the normal class. Those children of below average intelligence cannot be placed into normal classrooms; there is no place

for them when they are ready to leave the special class. There is one teacher for the class and she enforces the treatment procedure.

The major steps involved in systematic integration are: (a) to teach appropriate classroom behaviour so that disruptions are at a minimum; (b) to gradually increase the time spent in regular classes in that school so that students spend more time in them each day. This step serves to enhance generalization of appropriate classroom behaviour learned in the treatment setting to the regular classroom settings; (c) to finally move the children back to their original schools.

The immediate goal of the program, i.e., the first major step, is to increase constructive behaviours and to decrease inappropriate and neutral behaviours. The method used to produce the desired changes is a reinforcement plus time-out procedure. The reinforcements consist of teacher's verbal praise, points and ten-minute play breaks. Praise has been shown by several investigators (Becker et al., 1967; Broden et al., 1970; McAllister et al., 1969; Madsen, Becker and Thomas, 1968; Ward and Baker, 1968), to effectively increase appropriate behaviours and subsequently decrease disruptive behaviours. In this program, praise is to be given freely and emphatically whenever a child engages in constructive behaviours.

Points, based on a token system, have also been shown to increase the frequency of behaviours that they are contingent upon (Ayllon, Layman and Burke, 1972; Broden, Hall, Dunlap and Clark, 1970; Bushell, Wrobel and Michaelis, 1968; Ferritor, Buckholdt, Hamblin and Smith, 1972; McLaughlin and Malabys, 1972; Walker and Buckley, 1968). In systematic integration, points are awarded for work completed (the amount of work is determined by the teacher), having a constructive play break, and obeying teacher's instructions immediately. When a child accumulates a set number of points, he can exchange them for a small prize, usually a candy or toy.

The ten-minute play break is earned after an amount of work, determined by the teacher, is completed and checked. Free-time acts as a strong reinforcer in the modification of disruptive behaviour (Osbourne, 1969) and can increase the completion of academic tasks (Rowbury, Baer and Baer, 1976).

To decrease inappropriate behaviours, time-out is used. This consists of immediately isolating the child from the class as soon as he engages in any inappropriate or disruptive behaviour. The child is placed in a wooden booth in a corner of the classroom and has to remain there until he is quiet for three minutes. This removes him from any positive stimuli available in the room. Such a procedure has been shown to be quite effective in suppressing

unwanted behaviour in children (Bostow and Bailey, 1969; Leblanc, Busby and Thomson, 1974; Pendergrass, 1972; Ramp, Ulrich and Dulaney, 1971; White, Nielson and Johnson, 1972).

In the special class in the present study, the four children were observed weekly for a period of seven weeks, followed by daily observations for the continuation of the school year. At the outset, constructive behaviours for all four children were variable but for the majority of observations the frequency was low. The desired level for constructive behaviour was set at 80%. In addition, inappropriate behaviours and neutral behaviours were also variable but for the majority of the observations their relative frequency was high. The desired goals, with regard to these two categories, were to eliminate inappropriate behaviours (i.e., 0%) and consequently reduce neutral behaviours (see Figure 3).

After approximately 12 weeks of observation, little change was detected in the children's behaviours with the employed treatment technique. Lack of change appeared to be reflected by the teacher's not enforcing the contingencies properly. Points and playbreaks seemed to be given appropriately; however, the rate of praise statements and application of time-out, when warranted, appeared very low.

At this point, it was decided to test the effectiveness of audio cueing to increase rate of teacher praise in

this special class. A cue similar to that of Van Houten and Sullivan's was used with two exceptions. Instead of delivering cues via a public address system (there is not one in the school), the tone was presented on a cassette recorder which was placed by the observer in the classroom each day. The second exception was that cueing occurred at the rate of one per two minutes (as opposed to two per minute and three per minute used in Van Houten and Sullivan, 1975). Such a change seemed desirable considering the small number of children in the class. The small size of the class reduced the probability of an appropriate behaviour occurring at any point in time.

The purpose of this study was to extend the findings of Van Houten and Sullivan in three ways. First, the children in this study all have severe behaviour problems. In addition to the small class size, such behaviour problems would further reduce the frequency of occurrence of appropriate behaviours. Audio cueing would prove to be a very valuable technique if it is found effective in such a difficult class.

Second, there were two measures taken throughout the study. One was that of children's behaviour, including constructive, inappropriate and neutral behaviour. The second was that of teacher's behaviour, including rate of praise statements and application of time-out. Van Houten

and Sullivan did not include a measure of children's behaviour so they did not demonstrate the effect of increased teacher praise on child behaviour.

Third, an advantage of this study stems from the question posed by Van Houten and Sullivan regarding the effectiveness of audio cueing in the absence of the observer. It is felt that the present study partially answers this question in that there was an unobtrusive observer present throughout the school year. This claim is made on the basis of the relationship established with the teacher during the three months prior to the study. During this interval, the observer watched only the children, developed the behavioural definitions and the checklist. She then consulted the teacher, showing her the checklist, discussing the definitions and establishing contingencies for the various behaviours. This consultation took place prior to baseline recording of the teacher's behaviour. Furthermore, interactions occurred between the teacher and observer, pertaining to a more efficient classroom organization, and problems arising from one child's truancy as well as day to day troubles. The observer's manner was very low key and in no case was there any hint of resentment, anxiety or antagonism on the part of the teacher. The result of this history was that the entire reason for the observer's presence was thoroughly established as centered on the children. There was no change in this situation when baseline began and

even the checklist remained the same. Therefore, when the observer introduced the cueing technique, it was simply viewed as a new idea to put into action and from the teacher's standpoint did not focus on her as a target of observation. Thus, it is claimed that any effect of the cueing was independent of the evaluation. To conclude, the teacher had no reason to suspect and furthermore gave no indication of suspecting that she was being systematically evaluated. Therefore, this factor can not be accredited with influencing the results.

Other investigators (Becker et al., 1967; McAllister et al., 1969; Madsen et al., 1968; Thomas et al., 1968; Ward and Baker, 1968) have found an increased rate of praise to result in both an increase in constructive behaviour and a subsequent decrease in inappropriate behaviour. Such an effect might be expected in this study. However, it was felt that the teacher needed aid in identifying inappropriate behaviours since her application of time-out following inappropriate behaviours was low. Therefore, in addition to an audio cue to praise, an audio cue to time-out phase was planned.

The purpose of the present investigation is to increase the rate of teacher praise in a special class of four behaviour problem children, by the application of an audio cue. A second purpose of this study is to increase

the contingent application of time-out by the observer's manually sounding a device following an inappropriate behaviour.

It is hypothesized that:

1. The rate of teacher praise will increase with the aid of an audio cue played on a cassette recorder within the classroom and delivered at the rate of one per two minutes.
2. The rate of teacher application of time-out will increase with the aid of a manual audio cueing device delivered by the observer after each occurrence of an inappropriate behaviour.
3. With increased rate of teacher praise there will be an increase in the children's constructive behaviours (i.e., in time spent in constructive behaviours) and a decrease in the children's inappropriate behaviours (i.e., in time spent in inappropriate behaviours).
4. With increased application of time-out there will be a further decrease in the time spent in inappropriate behaviours.

The prediction that an audio cue will result in an increased rate of praise is based on the positive findings of Van Houten and Sullivan (1975). It is further felt that once an increase in rate of praise has been achieved, it will be maintained by the predicted increase in the children's constructive behaviour.

## Method

### Subjects

The teacher was a young female with no prior teaching experience. She had taken a number of special education courses and was working toward a college degree at the time of the study.

The children were three males and one female, ages six, six, eight and eight years. They had no obvious mental deficiency as tested on standard intelligence tests. The children were referred to the program by the regular schools which they previously attended. They were described as having long standing behaviour problems and had reached a point where the schools would not accept them for the following year. Teachers found these children demanding and difficult to handle and so felt that they could not cope with them in their classes.

These children had gone through most of the regular school referral agencies, such as guidance counsellor and the Department of Mental Health. At least one of the children had seen a psychiatrist and had spent time in the Janeway Children's Hospital for examination and treatment of his behaviour problem.

Setting

The study was conducted in a special class created for behaviour problem children. This class was held in Curtis Elementary School in St. John's.

The classroom was approximately 4.6 m. by 3.7 m. in size. It contained no window but was well lit. The classroom was divided into two parts: a work area and play area. The work area contained the blackboard, the children's desks and the teacher's desk. The play area contained a bookcase into which all books, toys and games were stored. The only door of the classroom opened into the play area. A time-out booth was situated in the corner of the play area directly opposite the door (see Appendix A for design of classroom).

Apparatus

A Sony-Matic Portable Videocorder was used to tape segments of the observation periods. The tapes were later used to obtain reliability checks. The camera was situated on a shelf above the door at the back of the room and thus was out of reach. The video recorder was placed on top of the bookshelf and easily accessible to the observer for recording desired periods. The recorder was in a vinyl carrying case and thus the reels of tape were not visible.

The video recorder was quietly turned on by the observer upon entering the classroom. Noise from the

recorder was masked by the noise of the lights and a fan within the classroom. Tapes were only changed when the children were out of the room such as recess time, lunch time, and after school.

The cue used for praise in this study was a counter service bell struck twice in quick succession. These cues were recorded on a Sony Cassette Recorder. A Hewlett-Packard calculator Model 25 (HP-25) was programmed to generate a quasi-random sequence of numbers that approximated a normal distribution with the range 1 - 120. Each number corresponded to the second that the cue occurred within a two minute block. This procedure yielded an average of one cue per two minutes. The cassette recorder was carried in each day by the observer and placed on top of the bookcase, next to which the observer was sitting.

The cue used for time-out was a commercially available bicycle horn. To muffle the harshness of the sound, the horn was wrapped in a layer of cloth. It was activated by depressing the button through the cloth for a duration of approximately one to two seconds.

The time-out booth used was of plywood construction, with a closing door. It was approximately 0.8 m. by 0.8 m. by 1.8 m. It contained no ceiling or floor and was empty inside.

Behavioural Descriptions

The behaviours exhibited by the children were classified into three main types: constructive behaviours, inappropriate behaviours and neutral behaviours. The behaviours were defined as follows:

I. Constructive Behaviours:

(i) Working on assignment: This category included the behaviours of sitting in seat quietly with books open to the appropriate page of work, reading such work or writing in relation to this work. This category also included obeying teacher's instructions by immediately (within 10 seconds) performing the task required of him,

(ii) Playing quietly in the play area: This behaviour included playing quietly alone with a game or toy or reading a storybook in the designated play area. Such behaviour was only labelled constructive if the behaviour occurred during a legal play break. If a child was quietly waiting for a game to begin, then he was also classed as participating in constructive play.

(iii) Co-operative play: This category included two or more children quietly playing together, playing a game or reading a story in the designated play area on a legitimate break.

(iv) Task-oriented questions: These behaviours included verbalizations regarding the assigned work. These verbalizations were designated constructive only if they occurred when the child had been recognized for raising his hand or when the teacher was working with the child.

II. Inappropriate Behaviours:

A. Aggressive Behaviours:

(i) Verbal Aggression: This category included verbalizations such as swearing at others, name-calling and threatening others.

(ii) Physical Aggression: (a) Physical aggression toward others consisted of hitting another person, threatening to hit another person (as indicated by a raised arm, foot or clenched fist directed toward that other person), or grabbing something from another; (b) physical aggression toward toys consisted of throwing toys, stamping on toys or banging toys; (c) physical aggression toward equipment involved overturning a desk, tearing up work assigned in the form of paper or books, cracking of pencils.

B. Non-Constructive/Non-Aggressive Behaviours:

(i) Playing with toys in desk: This behaviour involved taking toys to the desk and playing

with them there while the child was supposed to be working.

(ii) Checking on others: This behaviour consisted of going to another's desk while that other person was working.

(iii) Interrupting teacher: This category included calling out to the teacher out of turn while the teacher was busy with another person.

(iv) Leaving desk too soon: This behaviour involved rising from the seat and leaving the desk entirely while the student was supposed to be working on an assignment. This category also applied if the child had finished his work and left his desk without having his work checked or without being given permission to leave the desk.

(v) Inappropriate talk: This category included verbalizations made out of turn by a child while he was supposed to be working; verbalizations directed by a child in the play area toward a child who was working; verbalizations by a child directed toward another who was in time-out; loud and annoying throaty sounds; shouting; and arguing between two or more children.

(vi) Failure to obey the teacher: This behaviour, as the category suggests, involved refusal to comply within 10 seconds with an instruction given by the teacher.

(vii) Whining: This category refers to an exaggerated crying sound or a whimper.

(viii) Clinging to teacher: This behaviour involved holding on to the teacher, with arms around her. It also extended to hugging and kissing the teacher.

III. Neutral Behaviours:

This category included all those behaviours not previously classified. These behaviours were not constructive nor were they inappropriate. Examples of behaviours in this category included: sitting at the desk playing with a pencil, eraser or book, staring into space, simply standing or sitting and doing nothing, talking to the teacher or others while on a play break.

The behaviours exhibited by the teacher were classified into three main types: praise, inappropriate attention, application of time-out. These behaviours were defined as follows:

I. Praise:

This category included verbal praise constituting a commendatory statement made by the teacher to an

individual child engaged in some constructive behaviour (e.g., playing quietly, working on an assignment or obeying an instruction). Praise statements included such phrases as "good," "good work," "great job," "it's nice to see you working," "it's good to see you have a nice break." Phrases such as "that's right," "that's correct," and "okay" were not scored as praise statements.

II. Inappropriate Attention:

This category included scolding a child following an inappropriate behaviour. Scolding involved telling a child that he should not have behaved in the manner he did. Also included in this category was the teacher's threatening to punish (e.g., you will go to time-out if you don't stop misbehaving). Finally, whenever the teacher punished a child using a different method than time-out, the behaviour was scored as inappropriate attention. An example of this behaviour was standing the child in the corner of the classroom following an inappropriate behaviour.

III. Application of Time-Out:

This behaviour was scored whenever the teacher placed the child in the time-out booth immediately following (within 10 seconds) an inappropriate behaviour. The teacher would tell the child what he did wrong while en route to the time-out booth.

Observation Procedures

Observations were made during each school day for a total of two hours per day. This procedure permitted a total of 30 minutes of observation per child per day.

The observer sat in the classroom against one wall so that she was seated at the dividing line between the work area and the play area. This vantage point offered a total view of the whole room.

Each child was observed for 15 seconds in succession. This procedure was repeated daily for all four children until 120 fifteen second intervals were completed for each child.

For teacher behaviour, a check was placed within each interval that a praise statement occurred, that time-out was applied, or that an inappropriate punishment, in the form of scolding, occurred. The frequencies for each of these behaviours was then totaled over the two hour observation period per day.

Reliability of Observations

Reliability checks on the coding of children's behaviours and the teacher's behaviours were made using video tapes of approximately 30 minute segments of any given day. For the interobserver reliability calculations, a second person scored the tapes independently of the observer. This person was aware of the purpose of the study.

For the child behaviours, occurrence reliability was calculated. Both interobserver reliability and count-recount reliability coefficients were obtained. Inter-observer reliability was calculated by dividing the number of intervals in which both observers agreed by the total number of intervals the children were observed. Count-recount reliability was calculated between the first observer's initial observations in the classroom and her observations as scored from the videotape. Again this was achieved by dividing the number of agreements by the total number of intervals the children were observed.

For the teacher behaviours, occurrence-nonoccurrence reliability was calculated. Again both interobserver reliability and count-recount reliability measures were obtained. Interobserver reliability was calculated by dividing the number of intervals in which both observers agreed by the total number of intervals the teacher was observed. In this case, agreement included those intervals in which both observers recorded the same behaviour and also those intervals in which both observers recorded no behaviour. Therefore, agreement was computed by sub-tracting the number of disagreements from the total number of intervals the teacher was observed.

Count-recount reliability was calculated between the first observer's initial observations in the classroom and her observations as scored from videotape. This was

achieved by dividing the number of agreements by the total number of intervals the teacher was observed. As in the case of the interobserver reliability, agreement was computed by subtracting the number of disagreements from the total number of intervals of observation, therefore including those intervals in which it was agreed that no behaviour occurred.

Interobserver reliability was taken on four occasions during baseline and on five occasions during the first treatment phase (BBAA). It was not taken during the other phases. Count-recount reliability was taken on five occasions during baseline and on 11 occasions during the first treatment phase (BBAA). It was not taken during the other phases.

Procedure

The three conditions of baseline, cueing praise, and cueing punishment were introduced to the teacher according to a multiple baseline design. After ten weeks, there was a return to baseline for both conditions of praise and punishment for one week. Following the second baseline period, cueing was reinstated for praise alone.

Baseline. During this phase, the teacher was allowed to continue as she had been doing prior to this baseline period. She was given no special instructions during this phase and her behaviour was not manipulated in any way.

She was not aware that her behaviour was being recorded. Baseline recording continued for three and one-half weeks.

Cueing praise. On the day before the cueing phase was instituted the teacher was notified in the following manner by the observer:

> I have noticed that you become very busy with each child during the day and when involved with an individual child may not notice what the others are doing. I have decided to aid you in this respect by playing a tone on a cassette recorder, which I will bring in with me each day. The tone will occur randomly at a rate of one every two minutes and when you hear each tone, I want you to look around and praise someone who is engaged in constructive behaviour.

Examples of praise were then given to the teacher.

The children were informed of the cues the following day by the observer and were told that it was merely for the observer's work and to try and ignore them as much as possible.

The cues were presented only during the first two 30 minute periods of observation per day to permit an evaluation of cueing effects on noncued intervals, throughout training. This observation phase, labeled BBAA, where B represented a 30 minute cued period and A represented a 30 minute noncued period continued for five and one-half weeks.

Following this BBAA phase, an ABBA phase (i.e., middle two periods were cued) was instituted, in order to check for a fatigue effect. In this phase, cueing for

praise was given during the second and third 30 minute periods of observation per day. This allowed a comparison to be made between rates of teacher praise for the first and fourth 30 minute noncued periods. A difference between these two observation periods may then be attributed to fatigue. This ABBA phase continued for one week.

Cueing time-out. In this phase, which occurred four weeks after the BBAA phase began, in addition to cueing to praise, the teacher was also cued to apply time-out. On the day before this phase was instituted the teacher was informed that on the following day she would be aided in applying time-out. This was to be done by the observer manually sounding the bicycle horn whenever an inappropriate behaviour occurred. Again the teacher was told that often when she was absorbed with an individual child inappropriate behaviours of the other children go unnoticed. The observer would notify her of any misbehaviour that occurred and she could then apply time-out to the child displaying the inappropriate behaviour. When applying time-out the teacher was simply to take the child and place him in the time-out booth. While en route to the time-out booth the teacher was to tell the child what he did wrong.

The cues for time-out were given during the first two 30 minute periods of observation per day for one-and-one-half weeks. Following this, the cues were then given

according to a daily alternating design, i.e., on Day 1 the cues were given during the second and third 30 minute observation periods; on Day 2 the cues were given during the first and fourth 30 minute observation periods. This alternating design continued for a period of one week.

Baseline 2. Following the ABBA phase, there was a return to Baseline (Baseline 2) for a period of one week, in which observations and recording of behaviour continued but in which no cues for praise or time-out were given.

Cueing praise (ABBA 2). The reinstatement of the cueing praise only phase followed Baseline 2. The cue was given during the second and third 30 minute periods of observation per day, thus an ABBA 2 phase.

## Results

### Reliability

For the child behaviours, the occurrence reliability was computed for both interobserver and count-recount procedures. In both methods, the reliabilities were calculated by dividing the number of agreements on the occurrence of a behaviour by the number of agreements plus the number of disagreements and multiplying by 100. Both interobserver and count-recount reliabilities calculated on given dates are presented in Table 1.

The mean interobserver reliability was 82%, with a median reliability of 81% and a range of 69% to 96%. The mean count-recount reliability was 86% with a median reliability of 87% and a range of 70% to 94%.

For the teacher behaviour (i.e., rate of praise) occurrence-nonoccurrence reliability was assessed by interobserver and count-recount procedures. In both instances the reliabilities were calculated by dividing the number of agreements on both the occurrence and the nonoccurrence of a behaviour by the number of agreements plus the number of disagreements and multiplying by 100. Interobserver and count-recount reliabilities calculated on given dates are presented in Table 2.

Table 1

Percentages of Agreement in Occurrences of Defined Child Behaviours

| Phase | Observation Day | Method of Reliability | |
|---|---|---|---|
| | | Interobserver | Count-Recount |
| | 32 | 79% | 82% |
| | 33 | 74% | 85% |
| Baseline | 33 | 82% | 84% |
| | 34 | 85% | 94% |
| | 35 | | 83% |
| | 37 | | 69% |
| | 38 | 77% | 79% |
| | 39 | | 90% |
| | 40 | 70% | 87% |
| | 41 | | 96% |
| BBAA | 44 | 93% | 76% |
| | 45 | | 87% |
| | 46 | | 89% |
| | 51 | 81% | |
| | 58 | | 90% |
| | 59 | | 91% |
| | 60 | 94% | 89% |

Table 2

Percentage of Agreement in Occurrences and Non-Occurrences of Defined Teacher Behaviours

| Phase | Observation Day | Method Reliability | |
|---|---|---|---|
| | | Interobserver | Count-Recount |
| | 32 | 99% | 96% |
| | 33 | 90% | 94% |
| Baseline | 33 | 96% | 96% |
| | 34 | 92% | 90% |
| | 35 | | 93% |
| | 37 | | 90% |
| | 38 | 82% | 87% |
| | 39 | | 93% |
| | 40 | 85% | 92% |
| | 41 | | 94% |
| BBAA | 44 | 95% | 84% |
| | 45 | | 95% |
| | 46 | | 92% |
| | 51 | 89% | |
| | 58 | | 98% |
| | 59 | | 96% |
| | 60 | 90% | 94% |

The mean interobserver reliability was 91%, with a median reliability of 90% and a range of 84% to 98%. The mean count-recount reliability was 93% with a median reliability of 93.5% and a range of 82% to 99%.

Effects of Cueing on Teacher Behaviour

The primary concern of the current investigation was the effect of an audio cue on the rate of teacher praise statements. Daily praise rates for the cued and noncued conditions for all experimental phases are presented in Figure 1.

The mean rates of praise for each condition in each phase are represented in Figure 2. During baseline, the mean praise rate was 2.4 praises per 30 minutes. Upon the introduction of the cueing in the BBAA phase, there was an immediate increase in praise rate. The mean praise rate during cueing was 16.9 praises per 30 minutes, and the mean praise rate in the absence of cueing was 8.1 praises per 30 minutes. With the introduction of the ABBA phase, the mean rate of praise during cueing reached 17.5 praises per 30 minutes, while the absence of cueing was associated with a mean praise rate of 9.6 praises per 30 minutes. The removal of the audio cue during the second baseline phase appears to have had little effect upon the new rate of teacher praise. The mean rate of praise in this phase was 9.5 praises per 30 minutes, and thus is close to the noncued rates of the

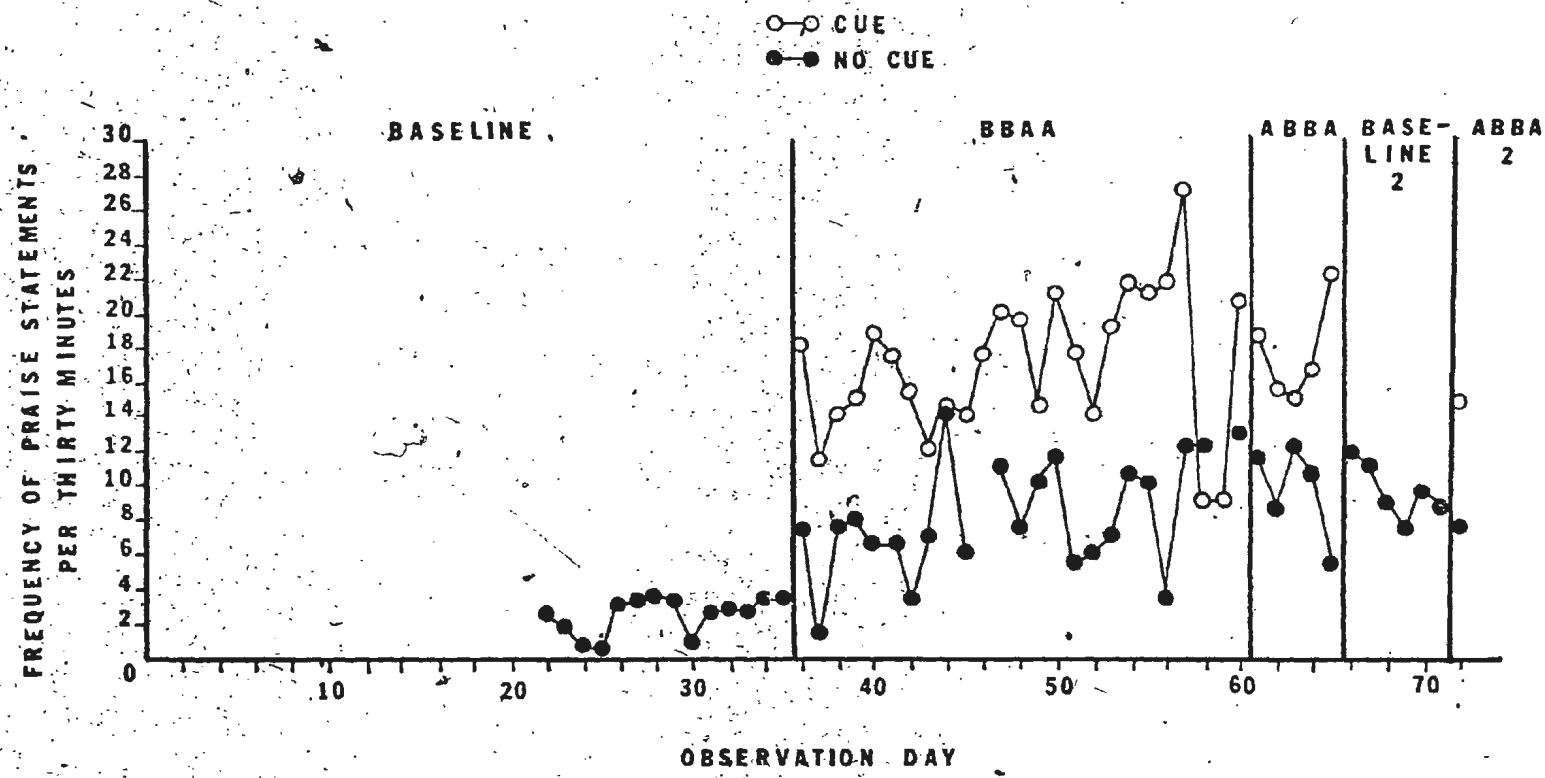



Figure 1. Daily rate of teacher praise statements for cue and no cue conditions in each experimental phase. (B = Cue; A = No Cue)

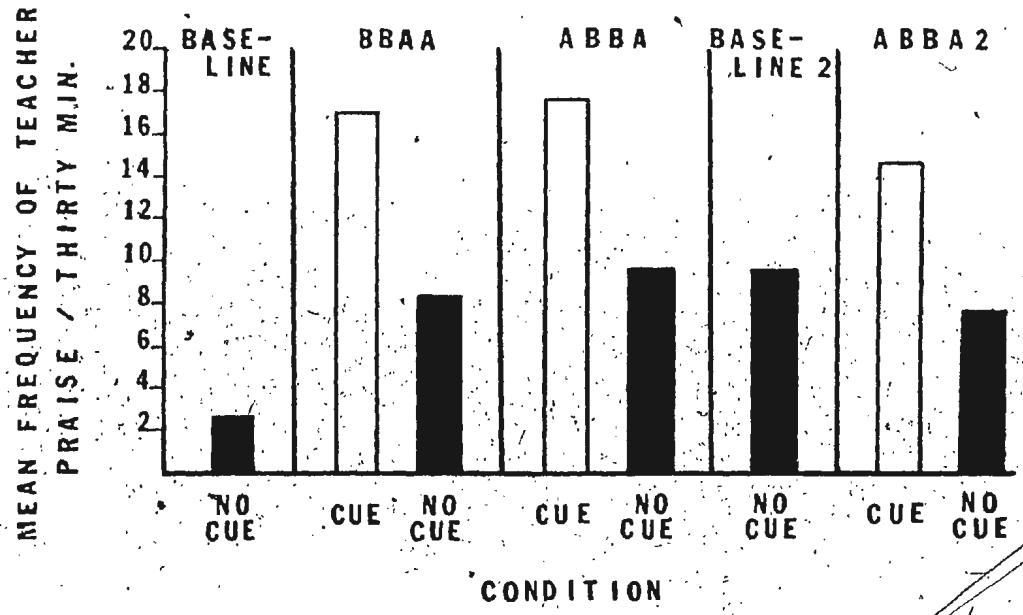



Figure 2. Mean rate of teacher praise statements for cue and no cue conditions in each experimental phase. (B = Cue; A = No Cue)

Table 3

Mean Frequency of Teacher Praise Statements per 30 Minutes for Each Observation Period in Each Experimental Phase

| Phase | Thirty Minute Period | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Baseline | 2.8 | 1.9 | 2.2 | 2.6 |
| BBAA | 17.6 | 16.2 | 9.1 | 7.1 |
| ABBA | 9.8 | 19.2 | 15.8 | 9.4 |
| Baseline 2 | 10.8 | 10.0 | 9.7 | 7.2 |
| ABBA 2 | 6.0 | 17.0 | 12.0 | 9.0 |

training phases. In the ABBA 2 phase, the mean praise rate during cueing was 14.5 praises per 30 minutes and in the absence of cueing, the mean praise rate was 7.5 praises per 30 minutes. Unfortunately, in this final phase, there was only one day of observation.

Since both cueing periods preceded the noncueing periods in the BBAA phase, it might be argued that the low praise rate during the noncueing period was due to fatigue. In order to check for such a fatigue effect, the mean rates of praise for each of the four 30 minute daily observation periods for each experimental phase were compared. These means are represented in Table 3. Of main concern here were the two phases BBAA and ABBA. In the BBAA phase, the two cued 30 minute periods produced significantly higher rates of praise than the two noncued 30 minute periods. Similarly, in the ABBA phase, the two cued 30 minute periods produced significantly higher rates of praise than the two noncued 30 minute periods. These higher praise rates occurred regardless of sequence, as indicated by the equivalent lower praise rates in the first and fourth 30 minute noncued periods of the ABBA phase. This finding, therefore, eliminates fatigue as a contributing variable to the different praise rates obtained in the cued and non-cued conditions.

For the cue for time-out phase, there are no data to report. It seems that with the introduction of high

rates of praise for constructive activity, the frequency of behaviours to be followed by time-out became very rare.

Effects of Cueing on Children Behaviour

A secondary concern of this study was the effect of an expected increase in rate of teacher praise statements, as a result of an audio cue, on the constructive, inappropriate and neutral behaviours of the four children. The group average percentage of 15 second intervals for the four children engaged in each of these categories of behaviour for each day of observation in all experimental phases are presented in Figure 3. Figure 4 represents the combined mean percentages, for the four children, engaged in each category of behaviour in each experimental phase. (See Appendix C for the individual children's daily graphs).

During baseline, constructive behaviour averaged 58% while inappropriate and neutral behaviours averaged 11% and 18%, respectively. With the introduction of cueing in the BBAA phase, constructive behaviour increased to 70% while inappropriate and neutral behaviours dropped slightly to 10% and 15%, respectively. During the ABBA phase, constructive behaviour reached an average of 81% and inappropriate behaviour significantly decreased to 1%. Neutral behaviour averaged 17% during this phase. During baseline 2, constructive behaviour maintained its average of 81%. Inappropriate and neutral behaviours changed slightly to 2%

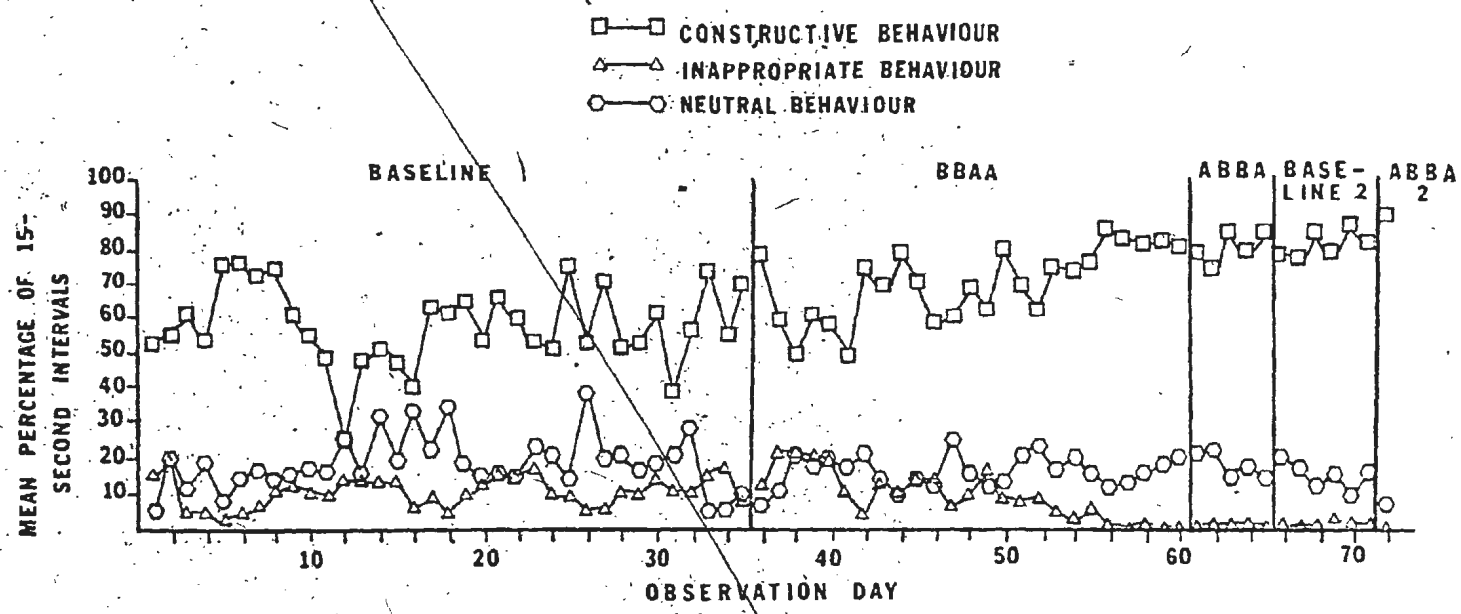



Figure 3. Mean percentage (for all four children) of 15 second intervals engaged in constructive, inappropriate, and neutral behaviours for each observation day in all experimental phases. (B = Cue; A = No Cue)

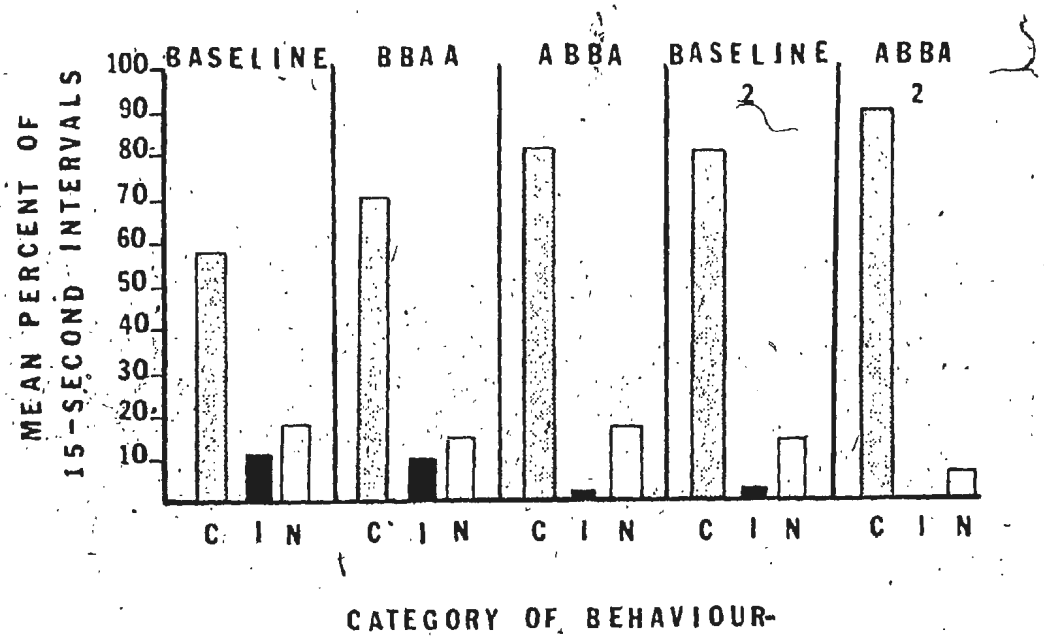



Figure 4. Mean percentage of 15 second intervals, averaged across days and children, of constructive, inappropriate and neutral behaviour in each experimental phase. (B = Cue; A = No Cue)

and 14%, respectively. With the reinstatement of cueing in the ABBA 2 phase, constructive behaviour reached 90%, inappropriate behaviour decreased to 0%, and neutral behaviour decreased to 7%.

All unaccounted for percentages, in each experimental phase, were percentages of the observed intervals spent in time-out or out of the classroom.

## Discussion

The results of this investigation clearly indicated that audio cueing effectively increased the rate of teacher praise statements. During the cued conditions, the mean praise rates were at least six times greater than during the initial baseline. In addition to this finding, a generalized effect from the cued conditions to the noncued conditions was also noted. During the noncued conditions, the mean praise rates were at least three times greater than during the initial baseline. This rate was maintained during the second baseline phase. This generalization was an encouraging finding as it may suggest an increased rate of teacher praise being maintained in the future. In the present study, a longer second baseline period was not feasible. It is difficult to predict future teacher behaviour based on such a short baseline phase. Therefore, only a follow-up study would be a definite confirmation of the maintenance of a generalized effect.

The possibility that fatigue might have been a contributing factor to the lower praise rates in the noncued condition of the BBAA phase was ruled out. The ABBA phase represented a change in sequence of the cued 30 minute periods. With the sequence change, the praise rates during the two cued conditions showed little change as compared

to the rates achieved in the cued conditions of the BBAA phase. In addition, the first and fourth 30 minute daily noncued periods in the ABBA phase produced no significant difference in praise rates. Therefore, the assumption that the cue, and not fatigue, was the important factor in the obtained differences between the cued and noncued conditions was confirmed.

The finding that cueing increased the rate of teacher praise is consistent with that of Van Houten and Sullivan (1975). However, the rates achieved in this study did not approximate the praise rates of Van Houten and Sullivan. Several methodological differences could be responsible for the discrepant findings. One of these differences was in the administration of cues. In the Van Houten and Sullivan study, cues were given at the rate of two per minute and three per minute, whereas in the present study, cues were given at the rate of one per two minutes. With lower rates of cueing, lower praise rates would be expected.

A second difference in praise rates lay in the initial teacher base rates of praise. The teachers in the Van Houten and Sullivan study had an average rate of praise of 0.67 praises per minute equaling 20.0 praises per 30 minutes. The teacher in this study had a mean rate of praise of only 2.4 praises per 30 minutes during baseline.

It was felt that, considering the baseline praise rates, the rates achieved during the cued conditions in this study were proportionate to those achieved by Van Houten and Sullivan (1975).

It was somewhat surprising that there was such a vast difference in teacher base rates of praise between the Van Houten and Sullivan study and the present investigation. The teacher in the present study was inexperienced as a teacher and had a very low praise rate for constructive behaviours. Perhaps the teachers in the Van Houten and Sullivan study were experienced teachers or simply more efficient in their administration of praise. A second explanation of the difference in base rates may pertain to class size. All three teachers in the Van Houten and Sullivan study had classes greater than 14 students. The teacher in the present study had a class of only four students. As discussed previously, perhaps in a smaller class, the teacher had fewer opportunities to praise appropriate behaviour. Thirdly, all three teachers in the Van Houten and Sullivan study were aware that the experimenters were present to help them increase their praise rates. The teachers received this information before the baseline recording. The teacher in the present study was not aware of the experimenter's intention to increase her praise rate. Perhaps, awareness of such an intention might produce initially high base rates. Further research is needed to

supply an explanation for the differences obtained in teacher base rates of praise.

A critical issue for the audio cueing technique was whether it would be an effective means of increasing teacher praise statements if the teacher were unaware that she was being evaluated. In the present study, the observer was perceived to be present only to observe the children. She had been attending the class for this sole purpose for 13 weeks prior to the introduction of cueing, and had not specifically informed the teacher that the purpose of the audio cue was to increase her rate of praise. Accordingly, the teacher associated the presence of the observer with observation of student and not teacher behaviour. With an unobtrusive observer present, there was still a significant increase in teacher's rate of praise.

The effectiveness of an unobtrusive observer can be further argued. In the present study, there was a significantly lower rate of praise in the noncued and second baseline periods, as compared to the rate in the cued periods. In the Van Houten and Sullivan study, there was no such difference. The rate of praise achieved during the cueing phase was maintained, and in some cases increased, during the second and third baseline periods. The discrepancy between the two studies might be explained by the perceived purpose of the observer. In the Van Houten and Sullivan

study, the teachers were aware of the observer's purpose to increase their praise rates. This factor might have combined with the generalized effect of the cue in maintaining the achieved praise rates during the baseline periods. In the present study, the teacher was not aware of the observer's purpose. With only the generalized effect of the cue operating during the noncued and baseline periods, a lower rate of praise resulted.

If this case of an unobtrusive observer is an approximate representation of a situation in which cueing is used with no observers present, then the implications appear quite promising. As Van Houten and Sullivan suggest, such a method is quite economical in terms of time and expense, and allows independent teachers to increase their rates of praising. Increased praise rates would in turn produce favourable results in the classroom behaviour of the children (Becker et al., 1967; Broden et al., 1970; McAllister et al., 1969; Madsen et al., 1968; Ward and Baker, 1968).

A second major advantage of this investigation was the recording of the children's behaviours in conjunction with that of the teacher's behaviour. The desired level for constructive behaviour was set at 80%. During the baseline phase, before the introduction of audio cueing, the children averaged only 58% constructive behaviour. With the introduction of the audio cue, there was a gradual

increase in the children's constructive behaviour until it hit and stabilized at the 80% level. This level was then maintained to the end of the study. Similarly, with inappropriate behaviour, the desired level was set at 0%. During baseline, the children averaged 11% inappropriate behaviour. After cueing was introduced, there was a gradual decrease in inappropriate behaviour until it reached 1% at which it stabilized. The level of neutral behaviour did not vary significantly from the baseline level throughout the study but did become more stable and less erratic. From all appearances, then, it seemed that following the introduction of an audio cue, which increased the rate of teacher praise, there was a significant and related change in the children's behaviour. This change was represented by an increase in constructive behaviour to an appropriate level, a decrease in inappropriate behaviour to near zero, and a stabilized level of neutral behaviour.

However, at least one variable must be examined before claiming that the desired changes, which occurred in the children's behaviour, were a consequence of cueing. On the 19th observation day, child 1, who demonstrated the most inconsistent constructive and inappropriate behaviours, (Appendix C), discontinued school. It was not until after this period of time that the behaviours of the other three children reached the levels at which they stabilized. It

might, therefore, be inferred that it was child 1's leaving which produced the behaviour changes of the other three children and not a consequence of the audio cue.

The main argument against child 1's leaving not being related to the behaviour changes, lies in the examination of the other children's behaviours on days when child 1 was absent, before his discontinuation of school (Appendix D). This examination revealed that the behavioural patterns of the other three children remained the same regardless of child 1's presence or absence. In either case, there was still much variability (both high and low levels) in each category of behaviour. Child 1's absence appeared to have no significant effect on the behaviour of the other three children. Therefore, it seems reasonable to conclude that child 1's leaving did not produce the changes which later occurred in the other children's behaviours.

However, there are two reasons why this assertion might be qualified. First, child 1 was never absent for more than four days prior to his leaving and, second, even if it is assumed that the absence of child 1 would not have produced the improvement in behaviour by itself, it is possible that the improvement resulted from an interaction between the experimental treatment and the child's absence.

There is one other argument. It appears from Figure 3 that the behavioural change, especially in constructive

behaviour, had begun to occur prior to child 1's leaving. Child 1's leaving school and the stabilized behaviour changes which followed seemed to have been an unfortunate coincidence.

In light of the above arguments, it may be concluded that the increased rate of teacher praise following audio cueing was an important factor in producing the changes in the children's behaviours.

One implication of this study is that audio cueing may be effective with a variety of populations. The present investigation involved a small class of four children, who displayed severe behaviour problems. In such a class, audio cueing was found effective in terms of both the teacher's behaviour and the children's behaviours. Difficult classes, such as the one in this study, may be helped with the aid of the audio cueing technique.

A second implication evolves around the simplicity of the audio cue as a teacher training technique. Teachers may be capable of using the audio cueing technique independently. Often a teacher becomes so busy with her teaching that she fails to apply the proper contingencies. In this case, simple, economical aids, such as an audio cue, may be most efficient in alerting her to attend more closely to the ongoing child behaviours.

One point must be made regarding audio cueing. In this study at least, audio cueing was very specific to

praise rate. There was no increase in the teacher's application of time-out when inappropriate behaviour occurred. Inappropriate behaviour did decrease with an increased rate of praise. However, whenever an inappropriate behaviour did occur, the teacher failed to apply the proper contingency (Appendix E). Therefore, it seems that various forms of audio cueing would have to be introduced systematically for each behaviour to be changed. In this study, a cue was introduced to increase application of time-out. Although it was contingent upon inappropriate behaviour, the cue was given only two of the four 30 minute periods per day. However, inappropriate behaviour had become very infrequent, often only occurring during the noncued periods. Thus, to be effective, it appeared that the cue should have been given during all four 30 minute periods.

## REFERENCES


Ayllon, T., Layman, D. & Burke, S. Disruptive behavior and reinforcement of academic performance. Psychological Record, 1972, 22, 315-323.

Becker, W. C., Madsen, C., Arnold, C. & Thomas D. Contingent use of teacher attitudes and praise in reducing classroom behavior. Journal of Special Education, 1967, 1, 287-307.

Bostow, D. E. & Bailey, J. B. Modification of severe disruptive and aggressive behavior using brief timeout and reinforcement procedures. Journal of Applied Behavior Analysis, 1969, 2, 31-37.

Broden, M., Bruce, C., Mitchell, M. A., Carter, V., & Hall, R. V. Effects of teacher attention on attending behavior of two boys at adjacent desks. Journal of Applied Behavior Analysis, 1970, 3, 199-203.

Broden, M., Hall, R. V., Dunlap, A. & Clark, R. Effects of teacher attention and a token reinforcement system in a junior high school special education class. Exceptional Children, 1970, 36, 341-349.

Bushell, D., Wrobel, P. A. & Michaelis, M. L. Applying "group" contingencies to the classroom study behavior of preschool children. Journal of Applied Behavior Analysis, 1968, 1, 55-61.

Clark, H. B., Macrae, J. W., Ida, D. M., & Smith, N. R. The role of instructions, modeling, verbal feedback, and contingencies in the training of classroom teaching skills. In E. Ramp & G. Semb (Eds.), Behavior analysis: areas of research and application. New Jersey: Prentice-Hall, Inc., 1975.

Cooper, M. L., Thomson, C. L., & Baer, D. M. The experimental modification of teacher attending behavior. Journal of Applied Behavior Analysis, 1970, 3, 153-157.

Cossairt, A., Hall, R. V., & Hopkins, B. L. The effects of experimenter's instructions, feedback, and praise on teacher praise and student attending behavior. Journal of Applied Behavior Analysis, 1973, 6, 89-100.

Ferritor, D. E., Buckholdt, D., Hamblin, R. L., & Smith, L. The non effects of contingent reinforcement for attending behavior on work accomplished. Journal of Applied Behavior Analysis, 1972, 5, 7-17.

Hall, R. V., Lund, D., & Jackson, D. Effects of teacher attention on study behavior. Journal of Applied Behavior Analysis, 1968, 1, 1-12.

Hawkins, R. P., Peterson, R. F., Schweid, E., & Bijou, S. W. Behavior therapy in the home: amelioration of parent-child relations with the parent in a therapeutic role. Journal of Experimental Child Psychology, 1966, 4, 99-107.

Jones, H. & Eimers, R. C. Role playing to train elementary teachers to use a classroom management "skill package." Journal of Applied Behavior Analysis, 1975, 8 (4), 421-433.

Kennedy, W. A. & Willcutt, H. C. Praise and blame as incentives. Psychological Bulletin, 1964, 62, 323-332.

LeBlanc, J. M., Busby, K. H., & Thomson, C. L. The functions of time-out for changing the aggressive behaviors of a preschool child: a multiple-baseline analysis. In E. Ulrich, T. Stachnik & J. Mabry (Eds.), Control of human behavior (Vol. III). Glenview, Illinois: Scott, Foresman and Co., 1974.

Madsen, C. H., Becker, W.C., & Thomas, D. R. Rules, praise, and ignoring: elements of elementary classroom control. Journal of Applied Behavior Analysis, 1968, 1, 139-150.

McAllister, L., Stachowiak, J., Baer, D., & Conderman, L. The application of operant conditioning techniques in a secondary school classroom. Journal of Applied Behavior Analysis, 1969, 2, 277-285.

McLaughlin, F. T. & Malaby, J. Reducing and measuring inappropriate verbalizations in a token classroom. Journal of Applied Behavior Analysis, 1972, 5, 329-333.

Moore, B. L. & Bailey, J. S. Social punishment in the modification of a preschool child's "autistic-like" behavior with a mother as therapist. Journal of Applied Behavior Analysis, 1973, 6, 497-507.

O'Leary, K. D. & Becker, W. C. The effects of a teacher's reprimands on children's behavior. Journal of School Psychology, 1968, 7, 8-11.

Osborne, J. G. Free-time as a reinforcer with management of classroom behavior. Journal of Applied Behavior Analysis, 1969, 2, 113-118.

Parsonson, S., Baer, A. M., & Baer, D. M. The application of generalized correct social contingencies: an evaluation of a training program. Journal of Applied Behavior Analysis, 1974, 7, 427-437.

Pendergrass, V. E. Timeout from positive reinforcement following persistent, high-rate behavior in retardates. Journal of Applied Behavior Analysis, 1972, 5, 85-91.

Ramp, E., Ulrich, R., & Dulaney, S. Delayed timeout as a procedure for reducing disruptive classroom behavior: a case study. Journal of Applied Behavior Analysis, 1971, 4, 235-239.

Ringer, V. M. J. The use of a "token helper" in the management of classroom behavior problems and in teacher training. Journal of Applied Behavior Analysis, 1973, 6, 671-677.

Rowbury, T. G., Baer, A. M., & Baer, D. M. Interactions between teacher guidance and contingent access to play in developing preacademic skills of deviant preschool children. Journal of Applied Behavior Analysis, 1976, 9 (1), 85-104.

Rule, S. A. Comparison of three different types of feedback on teachers' performance. In G. Semb (Ed.), Behavior analysis and education. Lawrence: University of Kansas Press, 1972.

Saudargas, R. A. Setting criterion rates of teacher praise. The effects of videotape feedback in a behavior analysis follow through classroom. In G. Semb (Ed.), Behavior analysis and education. Lawrence: University of Kansas Press, 1972.

Schutte, R. C., & Hopkins, B.L. The effects of teacher attention on following instructions in kindergarten class. Journal of Applied Behavior Analysis, 1970, 3, 117-122.

Thomas, D. R. Preliminary findings on self-monitoring for modifying teaching behaviors. In E. Ramp & B. Hopkins (Eds.), A new direction for education: behavior analysis (Vol. 1). Lawrence: University of Kansas Press, 1971.

Thomas, D. R., Becker, W. C., & Armstrong, M. Production and elimination of disruptive classroom behavior by systematically varying teacher's behavior. Journal of Applied Behavior Analysis, 1968, 1, 35-45.

Van Houten, R. & Sullivan, K. Effects of an audio cueing system on the rate of teacher praise. Journal of Applied Behavior Analysis, 1975, 8 (2), 197-201.

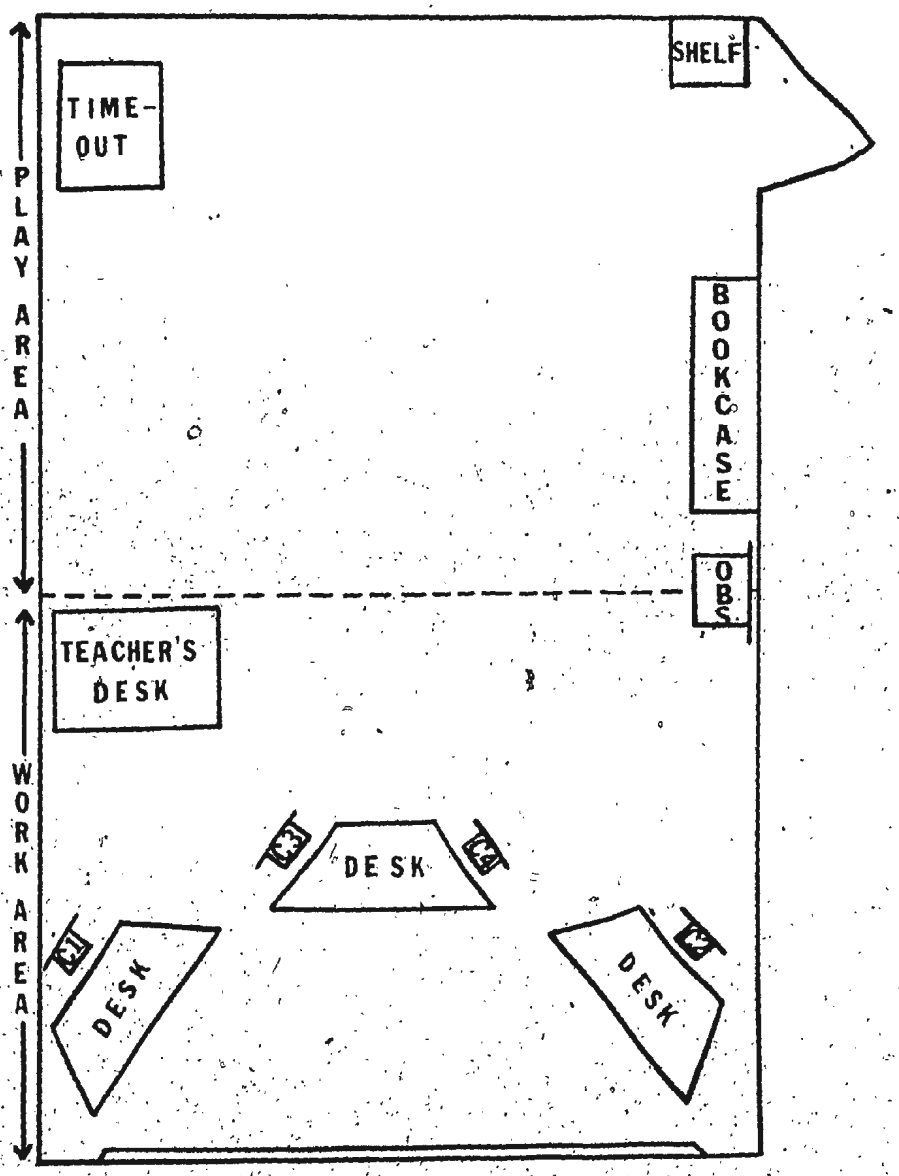
Walker, H. M. & Buckley, N. K. The use of positive reinforcement in conditioning attending behavior. Journal of Applied Behavior Analysis, 1968, 1, 245-252.

Ward, M. H. & Baker, B. L. Reinforcement therapy in the classroom. Journal of Applied Behavior Analysis, 1968, 1, 323-328.

White, G. D., Nielsen, G., & Johnson, S. M. Timeout duration and the suppression of deviant behavior in children. Journal of Applied Behavior Analysis, 1972, 5, 111-120.

# APPENDIX A

## Design of the Classroom


SHELF
TIME-OUT
PLAY AREA
BOOKCASE
OBS.
TEACHER'S DESK
WORK AREA
DESK
DESK
DESK

## APPENDIX B

Example of the Recording Form

| SUBJECT | CONSTRUCTIVE | | | | | AGGRESSIVE | | | | NON-CONSTRUCTIVE NON-AGGRESSIVE | | | | | | | | TIME SAMPLE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Working on Assign. | Playing at Toy Table | Task-Oriented Questions | Co-op Play | | Verbal | Physical - Others | Physical - Toys | Physical - Equip. | Playing with Items in Desk | Checking on Others | Interrupting Teacher | Leaving Desk/Station | Inappropriate Talk | Failure to Copy | Whining | Clinging to Teacher | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

# APPENDIX C

## List and Titles of Figures


| | | Page |
|---|---|---|
| Figure 1 | Daily percentage of 15 second intervals, for Child 1, engaged in constructive, inappropriate and neutral behavior in each experimental phase . . . . . | 63 |
| Figure 2 | Daily percentage of 15 second intervals, for Child 2, engaged in constructive, inappropriate and neutral behaviour in each experimental phase . . . . . | 64 |
| Figure 3 | Daily percentage of 15 second intervals, for Child 3, engaged in constructive, inappropriate and neutral behaviour in each experimental phase . . . . . | 65 |
| Figure 4 | Daily percentage of 15 second intervals, for Child 4, engaged in constructive, inappropriate and neutral behaviour in each experimental phase . . . . . | 66 |

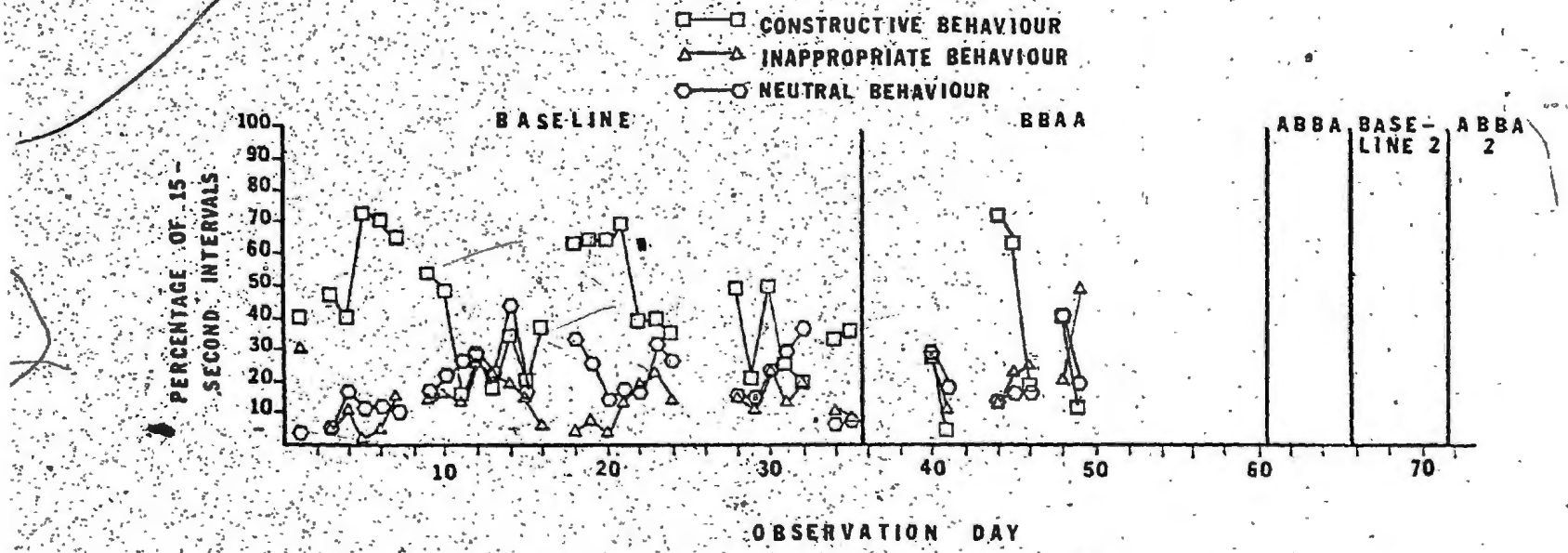



Figure 1. Daily percentage of 15 second intervals, for Child 1, engaged in constructive, inappropriate and neutral behaviour in each experimental phase.

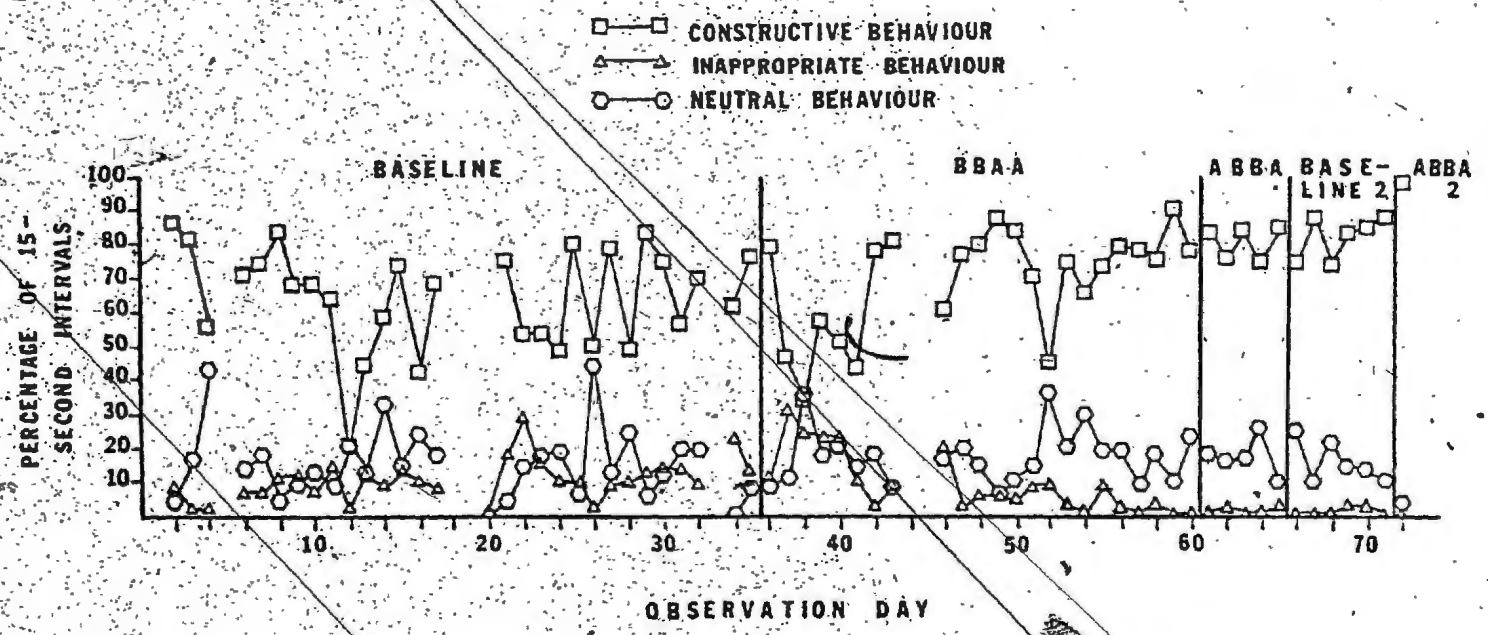



Figure 2. Daily percentage of 15 second intervals, for Child 2, engaged in constructive, inappropriate and neutral behaviour in each experimental phase.

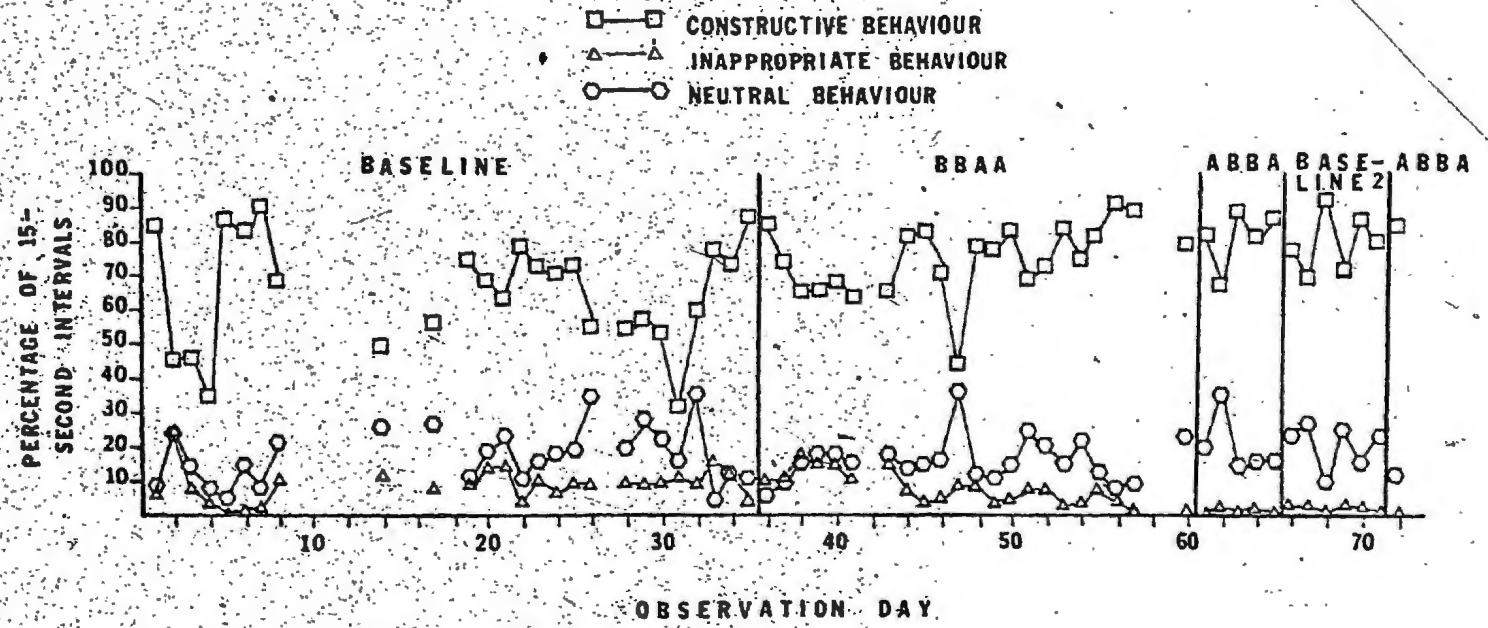



Figure 3. Daily percentage of 15 second intervals, for Child 3, engaged in constructive, inappropriate and neutral behaviour in each experimental phase.

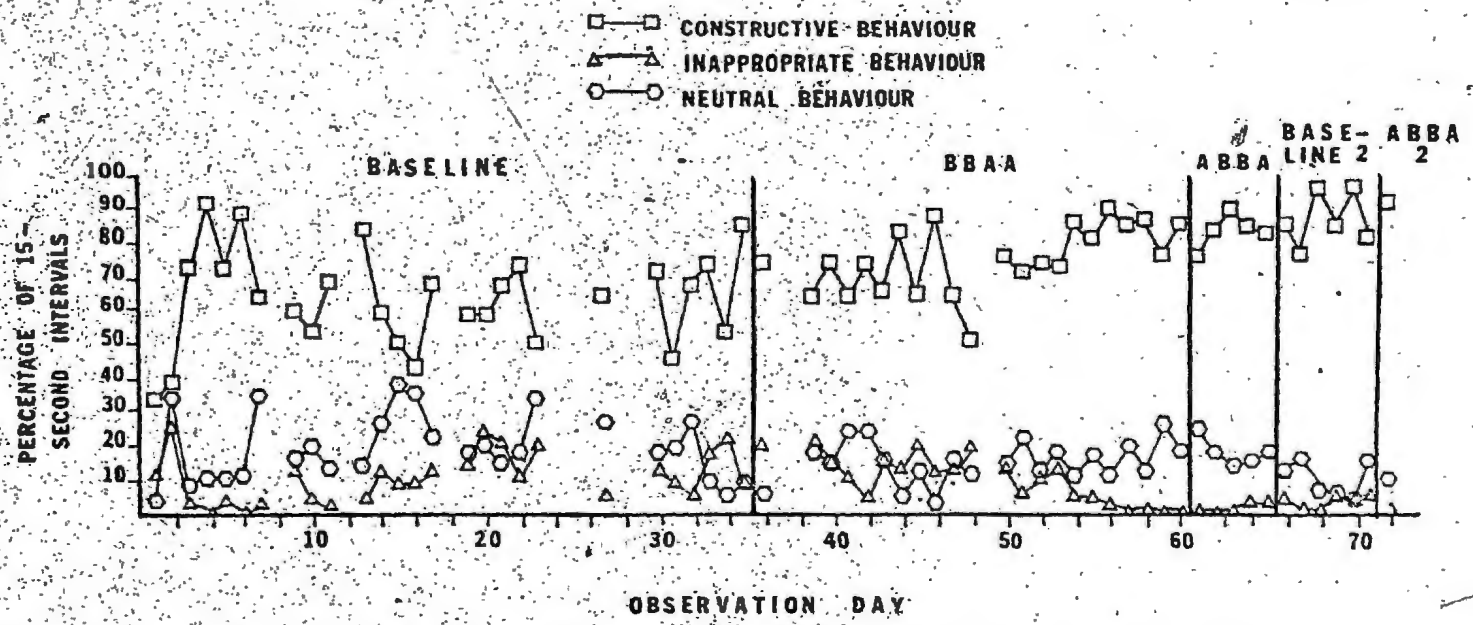



Figure 4. Daily percentage of 15 second intervals, for Child 4, engaged in constructive, inappropriate and neutral behaviour in each experimental phase.

## APPENDIX D

Table A Percentage of time children 2, 3 and 4 were engaged in constructive (C), inappropriate (I) and neutral (N) behaviours when child 1 was absent.

Table A

Percentage of Time Children 2, 3 and 4 were Engaged in Constructive (C), Inappropriate (I) and Neutral (N) Behaviours when Child 1 was Absent

| Days Child 1 Absent | Child 2 | | | Child 3 | | | Child 4 | | |
|---|---|---|---|---|---|---|---|---|---|
| | C | I | N | C | I | N | C | I | N |
| 2 | 87% | 9% | 4% | 46% | 26% | 24% | 38% | 25% | 33% |
| 8 | 83% | 11% | 5% | 68% | 11% | 21% | | | |
| 17 | 68% | 8% | 18% | 56% | 7% | 26% | 67% | 12% | 21% |
| 25 | 80% | 10% | 7% | 73% | 9% | 18% | | | |
| 26 | 50% | 3% | 43% | 55% | 8% | 33% | | | |
| 27 | 78% | 8% | 12% | | | | 64% | 5% | 26% |
| 33 | | | | 77% | 16% | 3% | 72% | 17% | 8% |
| 36 | 79% | 11% | 9% | 85% | 10% | 5% | 72% | 18% | 6% |
| 37 | 47% | 31% | 11% | 73% | 11% | 9% | | | |
| 38 | 33% | 24% | 34% | 65% | 18% | 14% | | | |
| 39 | 58% | 23% | 18% | 66% | 15% | 16% | 62% | 21% | 17% |
| 42 | 78% | 3% | 18% | | | | 72% | 5% | 22% |
| 43 | 81% | 8% | 8% | 66% | 15% | 17% | 65% | 15% | 13% |
| 47 | 77% | 3% | 20% | 43% | 8% | 34% | 64% | 12% | 15% |

## APPENDIX E

Figure 1. Percentage of time that time-out was applied in relation to inappropriate behaviour for each observation day.

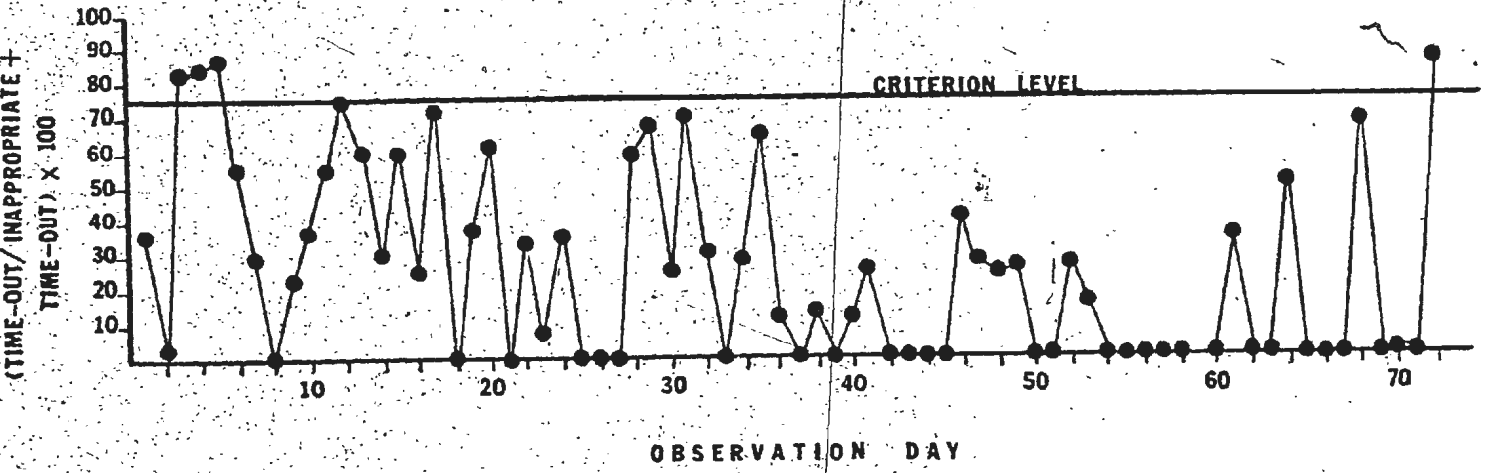



Figure 1. Percentage of time that time-out was applied in relation to inappropriate behaviour for each observation day. (The minimum time-out for inappropriate behaviour is three minutes. Each child is observed one interval per minute. Therefore for each inappropriate interval there should be at least three time-out intervals. Thus, time-out/inappropriate + time-out x 100 = 75%. Therefore the minimum criterion level is 75%. Below 75% indicates that time-out is not administered sufficiently for the number of inappropriate behaviours which occur).